"Western Treasure -- Deep, Wet Snow"

FEDERAL-STATE COOPERATIVE SNOW SURVEYS AND IRRIGATION WATER FORECASTS

for

RIO GRANDE DRAINAGE BASIN

MAY 1, 1948

By

Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Data included in this report were obtained by the agencies named above in cooperation with the U. S. Forest Service, National Park Service, State Engineers of Colorado and New Mexico and other Federal, State and local organizations.

May 1, 1948

WATER SUPPLY OUTLOOK

RIO GRANDE AND CANADIAN DRAINAGE BASINS

Based on the final snow surveys of the season the outlook for water supply in the Rio Grande and its tributaries in Colorado and New Mexico is favorable. Although snow accumulation during April was below normal, earlier snows have assured a good irrigation water supply. Stream flow is currently high. Reservoir storage is well above last year and snow cover at high elevations in the San Luis Valley is above normal. In New Mexico no surveys were made but snow cover is reported as above average at high elevations.

RIO GRANDE

Snow cover in the mountains surrounding San Luis Valley decreased substantially at medium and lower elevations during April but snow loss at high elevations was below average. At LaVeta Pass snow melt was unusually heavy, while at Wolf Creek Pass the snow water content is 30 percent above the May 1 average. Cumbres Pass is slightly below normal for May 1 but relatively higher than in previous months. On the east side of the valley stream flow will be about 10 percent above normal. The general water supply outlook is much improved over a year ago. Stream flow is high due to recent snow melt at valley and medium elevations. Recent precipitation has been deficient but soil moisture conditions are good. Reservoir storage is twice as much as last year and above the past ten-year average.

Similar conditions exist over the headwaters of the Rio Chama and other Rio Grande tributaries in northern New Mexico. Stream flow has been high and valley areas are wet along the tributary streams. Snow cover at high elevations is reported as above normal. Storage in El Vado reservoir increased rapidly during the past month and is now 98,000 acre-feet as compared to 84,000 on May 1, 1947. Valley precipitation in the middle Rio Grande area has been deficient during April and soil moisture conditions are fair.

The combined storage in Elephant Butte and Caballo reservoir is now 560,000 as compared to 717,000 a year ago. It is expected that storage in these reservoirs will materially increase this season. Recent precipitation has been light but soil moisture and crop conditions are reported as good in the lower Rio Grande valley in southern New Mexico. Stream flow is above normal.

In the Carlsbad area seasonal precipitation has been very deficient and the soil is dry. Storage in Alamogordo, McMillan and Avalon reservoirs is low and totals 7000 acre feet. Based on earlier snow surveys the flow of the Pecos due to melting snow, should be above average.

CANADIAN RIVER

Storage in Conchas Reservoir is now 364,000 acre-feet as compared to 358,000 a year ago on May 1. Snow cover on Canadian river tributaries on April 1 was 50 percent above normal and 100 percent over last year. Recent precipitation in the Tucumcari area has been deficient and soil moisture is dry. On May 1 there was no stream flow. Range and crop conditions on the irrigated area are reported as good.

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RIO GRANDE DRAINAGE BASIN

STREAM FLOW FORECASTS, May 1, 1948

Basin and Stream	April-September, inclusive, Streamflow Acre Feet				
	Forecast 1948	Measured Runoff 1947	1946	1945	10-year avg. 1937-1946
RIO GRANDE					
South Fork at South Fork	175,000	103,000	—	123,000	128,000
Rio Grande at Del Norte	800,000	530,000	347,000	467,000	550,000
Alamosa above Terrace Res.	100,000	68,500	39,500	77,000	77,000
Conejos at Mogote	250,000	176,000	124,600	221,000	225,000
Culebra at San Luis	45,000	43,000	16,000	39,000	38,000
Chama at Park View	225,000	—	79,000	243,000	246,000
Taos at Los Cordovas	70,000	21,000	4,800	65,000	49,000
Embudo Creek at Dixon	135,000	26,800	18,000	65,000	66,000
Rio Grande at Otowi Bridge	1,200,000	422,000	204,000	874,000	960,000
Rio Grande at San Marcial	1,000,000	180,000	57,000	593,000	805,000
Pecos at Pecos	110,000		24,720	69,000	71,000

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
RIO GRANDE BASIN

STATUS OF RESERVOIR STORAGE, MAY 1, 1948

STREAM	RESERVOIR	USABLE CAPACITY 1000 A.F.	THOUSANDS OF ACRE FEET IN STORAGE About May 1					May 1, 1948	
			1948	1947	1946	1945	10-yr. Avg. 1937-46	% Cap.	% Avg.
RIO GRANDE									
	Rio Grande	51.1	30.5	6.9	1.9	22.3	17.7	60	172
	Santa Maria	43.6	7.5	5.5	6.7	16.7	11.6	17	65
	Sanchez	103.2	12.0	7.4	9.1	12.1	19.0	12	63
	Terrace	17.7	10.7	2.4	2.4	3.8	4.9	61	218
	Continental	26.7	--	1.2	15.1	19.5	8.3	---	--
	Elephant Butte	2219.0	408.6	450.0	964.7	1212.9	1180.3	18	35
	Caballo	346.0	151.9	207.3	199.5	217.4	139.8	44	108
CHAMA RIVER									
	El Vado	226.0	98.0	84.1	151.1	140.0	127.6	43	77
CANADIAN RIVER									
	Conchas	374.9	364.4	358.7	333.5	341.2	262.7	97	138
PECOS RIVER									
	Alamogordo	132.2	1.5	23.2	4.4	7.0	59.9	1	2
	McMillan-Avalon	43.5	5.5	4.6	4.0	11.0	17.6	13	31

SNOW SURVEYS AND IRRIGATION WATER FORECASTS
for
RIO GRANDE BASIN
May 1, 1948

SUMMARY OF MAY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth			Water Content			Number Courses in Average	Snow Density			1948 Water Content in percent of	
	Twelve Year Avg.*	1947	1948	Twelve Year Avg.*	1947	1948		Twelve Year Avg.*	1947	1948	Twelve Year Avg.*	1947
	In.	In.	In.	In.	In.	In.		Percent	Percent	Percent		
Rio Grande	17.8	11.8	18.0	7.4	4.6	7.7	9	42	39	43	104	167
Upper Rio Grande	23.4	14.9	27.7	10.1	5.8	12.9	3	43	39	46	128	222
Alamosa River	3.2	0.0	1.6	1.1	0.0	0.4	1	34	--	25	36	--
Conejos River	22.0	10.2	21.8	10.2	4.4	8.9	2	46	43	41	87	202
Culebra River	28.5	28.7	24.0	10.2	9.3	9.0	1	36	32	37	88	97

*Some for shorter periods

PRECIPITATION DATA

WATERSHED	STATE	Precipitation October 1 to April 30	Departure from Normal	Precipitation * April	Departure Normal
		Inches	Inches	Inches	Inches
Canadian	New Mexico	6.10	+0.79	0.35	-0.97
Rio Grande	Colorado	8.70	+0.34	0.86	-0.08
Rio Grande (N)	New Mexico	7.96	+0.25	0.60	-0.61
Rio Grande (S)	New Mexico	4.40	-0.76	0.13	-1.15
Pecos	New Mexico	5.03	-0.31	0.25	-0.65

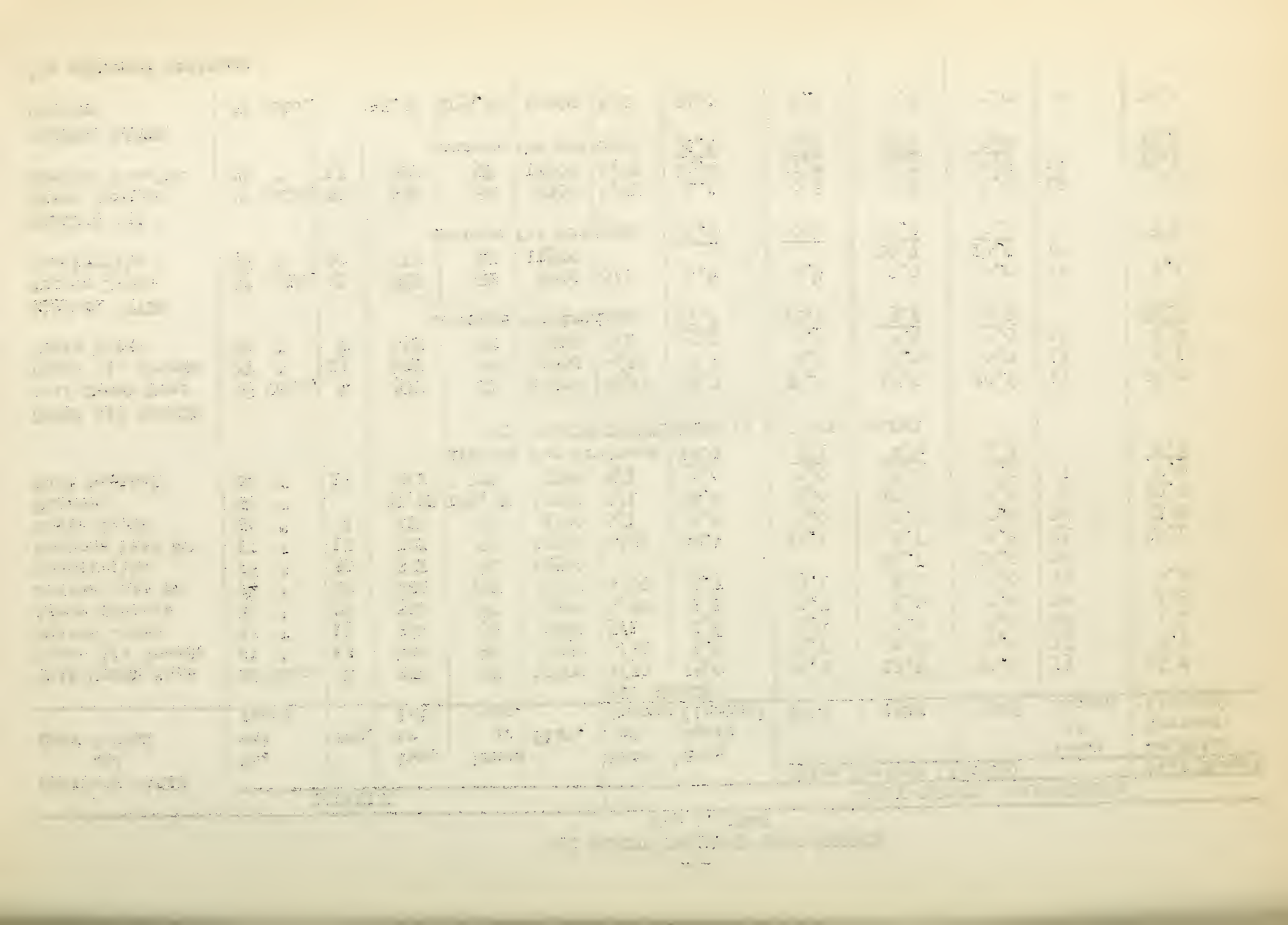
The accumulated precipitation since October 1 is above normal except in southern New Mexico. April precipitation was below normal in all areas.

*April precipitation tentative

RIO GRANDE DRAINAGE SNOW SURVEYS
May 1, 1948

DRAINAGE BASIN and SNOW COURSE	LOCATION					SNOW COURSE MEASUREMENTS						
								Water Content (Inches)				Past Record
	No. and State	Sec.	Twp. or lat.	Range or Long.	Elev.	Date of Survey	Snow Depth (Inches)	1948	1947	1946	Years of Record	Av. Water Content (Inches)
						RIO GRANDE						
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	4/30	75.0	36.0	17.5	10.6	13	26.8
Upper Rio Grande	27 "	13	40N	4W	9350	4/30	8.2	2.7	0.0	0.0	13	2.1
Silver Lakes	47 "	15	36N	5E	9600	5/1	1.6	0.4	0.0	0.0	12	1.1
River Springs	49 "	25	33N	6E	9300	4/30	1.1	0.5	0.0	0.0	12	1.2
LaVeta Pass #2	74 "	22	28S	70W	9300	4/29	9.3	3.1	5.0	0.0	13	4.2
Summitville	76 "	30	37N	4E	11500				20.7	14.5	10	
Cumbres Pass #2	77 "	17	32N	5E	10000	4/29	42.4	17.3	8.7	0.8	13	19.1
Santa Maria	80 "	8	41N	2W	9700	5/1	0.0	0.0	0.0	0.0	10	1.4
Culebra	82 "		37.2N	105.2W	10000	5/1	24.0	9.0	10.5	0.0	9	10.2
Fort Garland	84 "	13	29N	72W	8200	5/1	0.0	0.0	0.0	0.0	7	0.9
				Average for drainage			18.0	7.7	4.6	1.3		7.4
				RIO GRANDE TRIBUTARIES IN SAN LUIS VALLEY								
UPPER RIO GRANDE												
Wolf Creek Pass	26 Colo.	4	37N	2E	10000	4/30	75.0	36.0	17.5	10.6	13	26.8
Upper Rio Grande	27 "	13	40N	4W	9350	4/30	8.2	2.7	0.0	0.0	13	2.1
Santa Maria	80 "	8	41N	2W	9700	5/1	0.0	0.0	0.0	0.0	10	1.4
				Average for drainage			27.7	12.9	5.8	3.5		10.1
ALAMOSA RIVER												
Silver Lakes	47 Colo.	15	36N	5E	9600	5/1	1.6	0.4	0.0	0.0	12	1.1
Summitville	76 "	30	37N	4E	11500				20.7	14.5	10	
				Average for drainage			1.6	0.4	0.0	0.0		1.1
CONEJOS RIVER												
River Springs	49 Colo.	25	33N	6E	9300	4/30	1.1	0.5	0.0	0.0	12	1.2
Cumbres Pass*#2	77 "	17	32N	5E	10000	4/29	42.4	17.3	8.7	0.8	13	19.1
				Average for drainage			21.8	8.9	4.4	0.4		10.2
CULEBRA RIVER												
Culebra	82 Colo.		37.2N	105.2W	10000	5/1	24.0	9.0	9.3	0.0	9	10.2

*On adjacent drainage



The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Missouri-Arkansas and Rio Grande watersheds by furnishing funds or services.

STATE
- Colorado State Engineer
- Wyoming State Engineer
- Utah State Engineer
- New Mexico State Engineer
- Montana State Engineer
- Nebraska State Engineer
- Colorado Experiment Station
- Colorado Extension Service
- Montana Experiment Station
- Utah Experiment Station

FEDERAL
- Department of Agriculture
  - Forest Service
  - Soil Conservation Service
- Department of Interior
  - Bureau of Reclamation
  - Geological Survey
  - National Park Service
- Department of Commerce
  - Weather Bureau
- War Department
  - Army Engineer Corps

PUBLIC UTILITIES
- Colorado Public Service Company
- Western Colorado Power Company
- Montana Power Company
- Public Service Company of New Mexico
- Denver and Rio Grande Western R. R. Company

MUNICIPALITIES
- City of Bozeman
- City of Denver
- City of Boulder

WATER USERS ORGANIZATIONS
- Poudre Valley Water Users' Association
- Arkansas Valley Ditch Association
- Colorado River Water Conservation District

IRRIGATION PROJECTS
- Farmers Reservoir and Irrigation Company
- San Luis Valley Irrigation District
- Santa Maria Reservoir Company
- Costilla Land Company
- Uncompahgre Valley Water Users' Association
- Wyoming Development Company
- Goshen Irrigation District
- Kendrick Project
- Pathfinder Irrigation District
- Salt River Valley Water Users' Association
- San Carlos Irrigation and Drainage District
- Twin Lakes Reservoir and Canal Company

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